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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/361,980	07/28/1999	ICHIRO ITO	PM.262732	6217

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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 07/30/2002

15

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/361,980

Applicant(s)

ITO ET AL.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7-11, 26 and 27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-11, 26 and 27 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Information Disclosure Statement

1. The Examiner acknowledges Applicant's apology for the confusion regarding Japanese references lettered **OR**, **PR**, and **QR**, in which applicant has acknowledged the IDS filed July 28, 1999 was initialed and returned by the Examiner in Paper No. 4.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 9, 10, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruggiero (US 4,878,770) in view of Tachi et al. (US 4,986,877).

Ruggiero teaches a method of etching a metallic film, comprising steps of:

forming a TiW (same as applicant's metallic film) barrier layer **24** on a thin film resistor **22** (column 3, lines 24, 25, and 60);

forming an Al (same as applicant's conductive film) layer **28** on the TiW (metallic film) barrier layer **24** (Figure 3 and column 3, lines 43-44 and 58-61; and Figures 3 and 5);

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forming a first opening in the conductive (aluminum) film to expose the metallic (TiW barrier) film from the first opening (Figure 3 and 6A; column 3, lines 43-49 and 59-66);

forming a mask on the conductive (aluminum) film (Figures 3; column 3, lines 42-45 and 61-66); and

etching the metallic (TiW barrier) film through the second opening (Figures 4A and 7; column 3, lines 66-68).

Ruggiero differs in failing to teach the mask having a second opening having an opening area smaller than that of the first opening and open in the first opening, in claim 1.

Tachi teaches etching an aluminum conductive layer using a photoresist as an etching mask (column 2, lines 34-36) and forming the upper part of an opening of aluminum film having an area larger than that of the lower part (column 2, lines 60-64), which reads on the mask having a second opening having an opening area smaller than that of the first opening and open in the first opening.

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention by modifying Ruggiero's mask with Tachi's mask that has a second opening having an opening area smaller than that of the first opening and open in the first opening for the purpose of reducing the contamination of the semiconductor substrate to be etched (see Tachi, column 1, lines 48-54).

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4. Claims 7, 8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruggiero (US '770) in view of Tachi ('877) as applied to claim 1, and further in view of Stager et al. (US 5,372,673).

Ruggiero in view of Tachi differs in failing to specify recited processing parameters such as

the thickness of a first part and a second part of a metallic layer, **in claims 7 and 8**; and the thickness of a metallic film, **in claim 11**.

Stager teaches the thickness of the layer will vary from wafer to wafer (column 1, line 63-column 2, line 1).

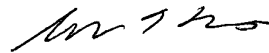
It would have been obvious to modify Ruggiero by varying the thickness of a layer as taught by Stager for the purpose of improving the etch selectivity between different layers of materials.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner can normally be reached on Second Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-972-9310 for regular communications and 703-972-9311 for After Final communications.

ltue

July 23, 2002


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